

50. (Amended) A product of the process of claim 48.

REMARKS

Continued prosecution and consideration of the claimed subject matter in the accompanying patent application is respectfully requested.

The first page has been amended to up-date the history of this application. Claims 1-20 have been cancelled. Claims 26, 39 and 50 have been amended. Claims 21-51 are in the case and are before the Examiner.

I. The Amendments

As already noted, the first paragraph of the application has been amended to up-date the history of this application. A marked-up copy of the amended first paragraph showing the changes made is attached hereto as part of the last page. The attached page is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE"

Claims 1-20 were cancelled because they correspond to claims that were allowed in the parent application.

Claims 26, 39 and 50 have been amended to better and more clearly define the invention. Marked-up copies of the claims showing the changes made are attached as a further part of the last page of this paper.

It is thus seen that no new matter has been added.

II. The Enclosed Application

Enclosed is a copy of the prior application, including the previously filed Declaration and Power of Attorney, recorded Assignment and cover sheet, as originally filed. The attached application papers are a true copy of prior application Serial No. 07/961,076 , filed October 14, 1992.

The attached application contains no new matter.

SUMMARY

The claims corresponding to previously allowed claims were cancelled in this divisional application.

The application is believed to be in condition for examination and allowance. An early notice to that effect is earnestly solicited.

A filing fee is enclosed based on the number of independent and dependent claims in the application after entry of this Preliminary Amendment. No further fee or petition is believed to be necessary. However, should any further fee be needed, please charge our Deposit Account No. 23-0920, and deem this paper to be the required petition.

The Examiner is requested to phone the undersigned should any questions arise that can be dealt with over the phone to expedite this prosecution.

Respectfully submitted,

By 

Edward P. Gamson, Reg. No. 29,381

Divisional Application
of Serial No. 07/961,076

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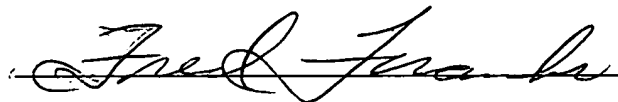
Enclosures

Substitute Page 1 of Divisional Application
Application Data Sheet
Transmittal Letter
Fee Transmittal for FY 2000 Sheet
Cert. of Mailing page
Preliminary Amendment and
Version with Marking to Show Changes Made
Previously filed Patent Application and Drawings
Previously filed Declaration and Power of Attorney
Previously filed Recorded Assignment and Cover Sheet
Previously filed Change of Address documents
Application Fee

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CERTIFICATE OF EXPRESS MAILING

I hereby certify that this Statement, together with a
Computer readable disk, Transmittal Letter and its stated
enclosures and Patent Application, are being deposited with the
United States Postal Service as Express Mail Label No.
EL854692669US postage prepaid, in an envelope addressed to:
Assistant Commissioner for Patents, Box Patent Application,
Washington, D.C. 20231 on November 19, 2001.



VERSION WITH MARKINGS TO SHOW CHANGES MADE"

Cross-Reference to related applications:

Phrase at page 1, line 13 has been added as follows:

This is a division of application Serial No.

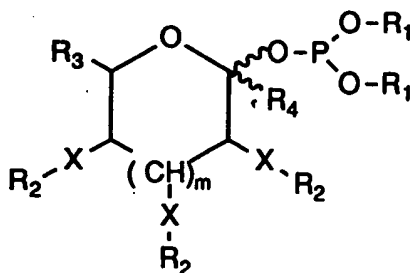
07/961,076, filed October 14, 1992, which is a continuation-in-
part of application Serial No. 07/910,612, filed July 8, 1992,
now U.S. Patent No. 6,319,695, which is a continuation-in-part
of application Serial No. 07/901,260, filed June 19, 1992, which
is a continuation-in-part of application Serial No. 07/777,662,
filed October 15, 1991, whose disclosures are incorporated
herein by reference.

In the claims:

Claims 1-20 have been cancelled.

26. (Amended) The reaction system of claim 21 [22] further
comprising a NADPH regeneration system.

39. (Amended) [The] A blocked phosphityl
monosaccharide of the formula:



wherein each R₁ is the same or different and is an
aryl group or a C₁-C₅ lower alkyl group;

X is independently oxygen or nitrogen;

R₂ is independently an acyl, benzyl, silyl or alkyl blocking group or X-R₂ together are [abasent] absent and are replaced by hydrogen;

R₃ is independently hydrogen, -CH₃, -OR₂, -CH₂OR₂, -CH(OR₂)-CH(OR₂), or -CH(OR₂)-CH(OR₂)-CH(OR₂);

R₄ is hydrogen, carboxyl or C₁-C₅ alkyl or benzyl carboxylate; and

m is zero or 1.

50. (Amended) [The] A product of the process of claim

48.

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PRODUCTION OF FUCOSYLATED CARBOHYDRATES BY
ENZYMATIC FUCOSYLATION SYNTHESIS OF SUGAR
NUCLEOTIDES; AND IN SITU REGENERATION OF GDP-FUCOSE

Cross-Reference to Related Applications

5 This is a divisional of application Serial
No. 07/961,076, filed October 14, 1992, which is a
continuation-in-part of U.S. patent application Serial
No. 07/910,612, filed July 8, 1992, that is a
continuation-in-part of U.S. patent application Serial
10 No. 07/901,260, filed June 19, 1992, that is a
continuation-in-part of U.S. patent application Serial
No. 07/777,662, filed October 15, 1991, now abandoned,
whose disclosures are incorporated herein by reference.

15 BACKGROUND OF THE INVENTION

Field of the Invention

This invention provides for improved methods
of enzymatic production of carbohydrates especially
fucosylated carbohydrates. The invention provides for
20 improved synthesis of glycosyl 1- or 2-phosphates using
both chemical and enzymatic means. These
phosphorylated glycosides are then used to produce
sugar nucleotides which are in turn used as donor
sugars for glycosylation of acceptor carbohydrates.
25 Especially preferred herein is the use of the disclosed
methods for fucosylation.

Summary of the Invention

This invention provides for a method of
30 producing a fucosylated carbohydrate in a single
reaction mixture comprising the steps of: using a
fucosyltransferase to form an O-glycosidic bond between
a nucleoside 5'-diphospho-fucose and an available
hydroxyl group of a carbohydrate acceptor molecule to
35 yield a fucosylated carbohydrate and a nucleoside